

LC-301/PCT/US/CON

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Continuation of:

In re Application of:)
: Examiner: S. Berman
STAN WOJCIAK ET AL.)
: Group Art Unit: 1711
Application No.: 09/486,423)
:
Filed: October 20, 1999)
:
For: RADIATION-CURABLE,)
CYANOACRYLATE-CONTAINING :
COMPOSITIONS) February 20, 2002

Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

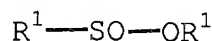
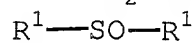
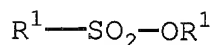
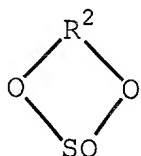
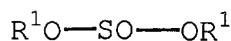
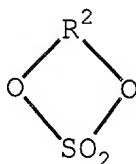
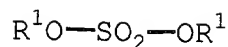
Sir:

Preliminary to examination on the merits, kindly
amend the subject application as follows:

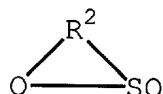
IN THE SPECIFICATION:

Page 12, line 36, kindly insert the following new
paragraphs:

The sulfur-containing compounds effective for
enhancing the thermal resistance of the cured cyanoacrylate
polymer may be represented according to the formula:



or

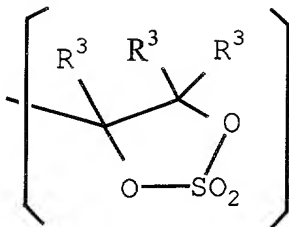


where R^1 and R^2 are, respectively, monovalent and divalent hydrocarbon groups which may be optionally substituted with halogen, NO_2 , oxo ($=O$), CN, alkoxy, hydroxy, acyloxy or SO_2 or interrupted by one or more ether oxygen atoms.

The sulfur-containing compounds are suitably employed at levels of about 0.1-10% by weight of the inventive composition.

More specifically, the thermal resistance conferring compound used in the inventive compositions, include by way of example, acyclic and cyclic sulfates, such as diphenyl sulfate, dibutyl sulfate; and compounds, such as 1,3,2-dioxathiolene-4-ethyl-2,2-dioxide and the di(cyclic

sulfate) of 1,2,7,8-octane tetraol which have one or more groups of the formula:



where R³ is independently H, alkyl or aryl; anhydrosulfites, such as α-hydroxyisobutyric acid anhydrosulfite; sulfoxides such as dibutylsulfoxide, di-α, α'-phenylethylsulfoxide and α-methylthioxo-γ-butyrolactone; sulfites such as glycol sulfite, dimethyl sulfite diethyl sulfite and o-phenylene sulfite; sulfonates, such as ethyl methanesulfonate, ethyl trifluoromethane sulfonate, methyl p-toluenesulfonate, n-butyl p-toluenesulfonate, benzyl p-toluenesulfonate, α-methylbenzyl p-toluenesulfonate, α,α-dimethylbenzyl p-toluenesulfonate and the diethyl ester of acetone disulfonic acid; and sulfinates such as methyl-p-toluenesulfonate.

These compounds are usefully employed at levels in the range of about 0.1%-10% by weight of the inventive composition, preferably at least 0.5% and more typically about 0.75%-5% by weight of the inventive composition.

IN THE CLAIMS:

Please amend Claims 1, 14, 16, 18, 19, and 22-25 to read as follows:

1. (Amended) A composition comprising:

(a) a 2-cyanoacrylate of the formula $H_2C=C(CN)-COOR$, wherein R is selected from the group consisting of C_{1-15} alkyl, alkoxyalkyl, cycloalkyl, alkenyl, aralkyl, aryl, allyl and haloalkyl groups,

(b) a metallocene,

(c) a polymerisingly effective amount of a photoinitiator to render the composition capable of photocuring in air upon exposure to at least one type of electromagnetic radiation selected from the group consisting of ultraviolet light, visible light, electron beam, x-ray and infrared radiation, and

(d) a sulfur-containing compound selected from the group consisting of sulfonates, sulfinates, sulfates, and sulfites.

14. (Amended) The composition according to Claim 1, wherein the photoinitiator is selected from the group consisting of 1-hydroxycyclohexyl phenyl ketone, 2-methyl-1-2-morpholino propan-1-one, benzophenone, 2-benzyl-2-N,N-dimethylamino-1-(4-morpholinophenyl)-1-butanone, 2,2-dimethoxy-2-phenyl acetophenone, bis(2,6-dimethoxybenzoyl-2,4,4-trimethyl pentyl) phosphine oxide, 2,4,6-trimethylbenzoyldiphenyl-phosphine oxide, bis(2,4,6-trimethyl

benzoyl) phenyl phosphine oxide, 2-hydroxy-2-methyl-1-phenyl-propan-1-one, alkyl pyruvates, aryl pyruvates and combinations thereof.

16. (Amended) The composition according to Claim 1, further comprising a member selected from the group consisting of viscosity-modifying agents, rubber toughening agents, thixotropy rendering agents, [thermal-stabilizing agents] and combinations thereof.

17. (Amended) The composition according to Claim 1, wherein the composition is useful as an adhesive, a sealant or a coating.

18. (Amended) A method of polymerizing a composition, said method comprising the steps of:

(a) providing an amount of the composition according to Claim 1; and

(b) subjecting the composition to a sufficient amount of said electromagnetic radiation to cure the composition.

19. (Amended) The composition according to Claim 1, in a one-part formulation.

22. (Amended) A reaction product formed from the composition according to Claim 1, after exposing the composition to electromagnetic radiation effective to cure the composition.

23. (Amended) An article assembled with a composition according to Claim 1, selected from the group consisting of needles, syringes, lancets, hypodermics, injectors, bodily fluid collector sets, cannula/hub assemblies, cannula/tube assemblies, tube sets, intravenous sets, fluid delivery and withdrawal sets, suction tubes, anesthesia masks, face masks, surgical masks, angioplast catheters, balloon catheters, disc drives, magnetic sensors, battery holding cartridges, loud speakers, phase holograms, lenses and jewelry.

24. (Amended) A method of manufacturing an article, comprising:

selecting portions of needles, syringes, lancets, hypodermics, injectors, bodily fluid collector sets, cannula/hub assemblies, cannula/tube assemblies, tube sets, intravenous sets, fluid delivery and withdrawal sets, suction tubes, anesthesia masks, face masks, surgical masks, angioplast catheters, balloon catheters, disc drives, magnetic sensors, battery holding cartridges, loud speakers, phase holograms, lenses or jewelry;

applying a composition according to Claim 1 to said portions; and

polymerizing said composition to thereby assemble said portions.

25. (Amended) A method of repairing an article, comprising:

selecting a broken article selected from the group consisting of needles, syringes, lancets, hypodermics, injectors, bodily fluid collector sets, cannula/hub assemblies, cannula/tube assemblies, tube sets, intravenous sets, fluid delivery and withdrawal sets, suction tubes, anesthesia masks, face masks, surgical masks, angioplast catheters, balloon catheters, disc drives, magnetic sensors, battery holding cartridges, loud speakers, phase holograms, lenses and jewelry;

applying a composition according to Claim 1 to said broken article; and

polymerizing said composition to thereby repair said broken article.

Please cancel Claim 15, without prejudice or disclaimer of that which is defined thereby.

Please enter new Claims 31-34 as follows:

-- 31. (New) The composition according to Claim 1, which cures to provide a non-tacky surface in less than 5 seconds.

32. (New) The composition according to Claim 1, wherein the photoinitiator is a member selected from the group consisting of UV photoinitiators, visible light photoinitiators, UV/visible light photoinitiators, and combinations thereof.

33. (New) The composition according to Claim 1, wherein the photoinitiator is a member selected from the group consisting of dl-camphorquinone, bis(η^5 -2,4-cyclopentadien-1-yl)-bis[2,6-difluoro-3-(1H-pyrrol-1-yl)phenyl]titanium, and combinations thereof.

34. (New) The composition according to Claim 1, wherein the composition has a viscosity in a range selected from the group consisting of 1-3 cps, 1-15 cps, 100-300 cps, and 600-1000 cps. --

REMARKS

Upon entry hereof, the claims will be 1-14 and 16-34, with only Claim 1 being independent. Claims 1, 16, 18-19 and 22-25 have been amended to better define the invention. A marked-up copy of Claims 1, 14, 16, 18, 19, and 22-25

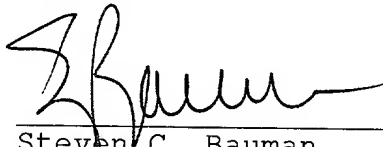
showing the changes made thereto, is attached. Claims 31-34 are presented in order to afford Applicants with the scope of protection to which they are entitled. Claim 14 has been amended to delete the term "visible light photoinitiator", as it would appear to be a genus listed among a series of specie. The term "visible light photoinitiators" has been re-presented, together with UV light photoinitiators and UV/visible light photoinitiators in new Claim 32, and several specific visible light photoinitiators have been presented in Claim 33.

The specification has been amended to include a more complete description of sulfur-containing compounds to which reference was made through U.S. Patent No. 5,328,944 (Attarwala), useful in the inventive compositions, clauses of which are now set forth as recitation (d) in Claim 1, as amended. The inclusion in the inventive composition of such clauses renders the cured composition more resistant to thermal degradation. The '944 patent, a copy of which is attached for the Examiner's convenience, has been incorporated by reference in the subject application at page 12, lines 23-29. Thus, this specification amendment is in compliance with 35 U.S.C. § 112; 37 C.F.R. § 1.75(d)(1); and M.P.E.P. § 608.01(p) and (v). Accordingly, no new matter has been added.

In view of the foregoing claim amendments, new claims and remarks, favorable consideration and passage to issue of the present case is respectfully requested.

Applicants' undersigned attorney may be reached by telephone at (860) 571-5001, by facsimile at (860) 571-5028, or by email at steve.bauman@loctite.com. All correspondence should be directed to the address given below.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE TO CLAIMS

1. (Amended) A composition comprising:

(a) a 2-cyanoacrylate of the formula $H_2C=C(CN)-COOR$, wherein R is selected from the group consisting of C_{1-15} alkyl, alkoxyalkyl, cycloalkyl, alkenyl, aralkyl, aryl, allyl and haloalkyl groups,

(b) a metallocene, [and]

(c) a polymerisingly effective amount of a photoinitiator to render the composition capable of photocuring in air upon exposure to at least one type of electromagnetic radiation selected from the group consisting of ultraviolet light, visible light, electron beam, x-ray and infrared radiation, and

(d) a sulfur-containing compound selected from the group consisting of sulfonates, sulfinates, sulfates, and sulfites.

14. (Amended) The composition according to any of Claim 1, wherein the photoinitiator is selected from the group consisting of 1-hydroxycyclohexyl phenyl ketone, 2-methyl-1-2-morpholino propan-1-one, benzophenone, 2-benzyl-2-N,N-dimethylamino-1-(4-morpholinophenyl)-1-butanone, 2,2-dimethoxy-2-phenyl acetophenone, bis(2,6-dimethoxybenzoyl-2,4[-],4-trimethyl pentyl) phosphine oxide, [2-hydroxy-2-methyl-1-phenyl-propan-1-one, 2-hydroxy-2-methyl-1-phenyl-1-propane,] 2,4,6-trimethylbenzoyldiphenyl-phosphine oxide, bis(2,4,6-trimethyl benzoyl) phenyl phosphine oxide, 2-

hydroxy-2-methyl-1-phenyl-propan-1-one, [visible light photoinitiators, dl-camphorquinone] alkyl pyruvates, aryl pyruvates and combinations thereof.

16. (Amended) The composition according to Claim 1, further comprising a member selected from the group consisting of viscosity-modifying agents, rubber toughening agents, thixotropy rendering agents, and combinations thereof.

18. (Amended) A method of polymerizing a [photocurable] composition, said method comprising the steps of:

(a) providing an amount of the composition according to [any one of] Claim[s] 1[-14 and 17]; and

(b) subjecting the composition to a sufficient amount of said electromagnetic radiation to cure the composition.

22. (Amended) A reaction product formed from the composition according to [any one of] Claim[s] 1[-17 and 19-21], after exposing the composition to electromagnetic radiation effective to cure the composition.

23. (Amended) An article assembled with a composition according to [any one of] Claim[s] 1[-17, and 19-21], selected from the group consisting of needles, syringes, lancets, hypodermics, injectors, bodily fluid collector sets,

cannula/hub assemblies, cannula/tube assemblies, tube sets, intravenous sets, fluid delivery and withdrawal sets, suction tubes, anesthesia masks, face masks, surgical masks, angioplast catheters, balloon catheters, disc drives, magnetic sensors, battery holding cartridges, loud speakers, phase holograms, lenses and jewelry.

24. (Amended) A method of [using] manufacturing [a] composition according to any one of Claims 1-17, and 19-21, to manufacture] an article comprising: [selected from the group consisting] selecting portions of needles, syringes, lancets, hypodermics, injectors, bodily fluid collector sets, cannula/hub assemblies, cannula/tube assemblies, tube sets, intravenous sets, fluid delivery and withdrawal sets, suction tubes, anesthesia masks, face masks, surgical masks, angioplast catheters, balloon catheters, disc drives, magnetic sensors, battery holding cartridges, loud speakers, phase holograms, lenses [and] or jewelry;

applying a composition according to Claim 1 to said portions; and

polymerizing said composition to thereby assemble said portions.

25. (Amended) A method of [using a composition according to any one of Claims 1-17, and 19-21, to repair] repairing an article selected from the group consisting of needles, syringes, lancets, hypodermics, injectors, bodily

fluid collector sets, cannula/hub assemblies, cannula/tube assemblies, tube sets, intravenous sets, fluid delivery and withdrawal sets, suction tubes, anesthesia masks, face masks, surgical masks, angioplast catheters, balloon catheters, disc drives, magnetic sensors, battery holding cartridges, loud speakers, phase holograms, lenses and jewelry;

applying a composition according to Claim 1 to
said broken article; and

polymerizing said composition to thereby
repair said broken article.